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ABSTRACT

Presented are the special education program description and process guide for the Program Data Analysis Plan (PDAP) developed in Colorado and designed to be replicated by other states. The Colorado special education program is described under the following categories: purpose and authorization, state level management and organization, modes of service (special class or itinerant instruction), applications (local organization), funding, determination of eligibility for service, and administrative procedures. Also discussed are program monitoring, approval, certification, reimbursement, development, and evaluation. The process of PDAP development is said to have involved the identification of management information requirements by means of a list of policy questions developed by program managers, collection of data, analysis of input from policy questions and data, and the explicit formulation of analytic procedures to be followed by applying the data to the answering of management information questions. Use of the PDAP is said to consist of locating in the PDAP a question pertinent to the informational need, using state and federal forms listed on the PDAP to locate the data, and analyzing the data to gain the information needed for decisionmaking. See EC 051 399 for a companion document. (DB)

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PROGRAM DESCRIPTION AND PROCESS GUIDE

for

The Program Data Analysis Plan

for

Colorado Special Education

by

Charles A. Darby, Jr.
Winston A. McCorkell
David B. Orr

EC 051 398E

Scientific Educational Systems, Inc.
Silver Spring, Maryland

September 1972

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Introduction

This document is the companion document to the PROGRAM DATA ANALYSIS PLAN FOR COLORADO SPECIAL EDUCATION. Although the PROGRAM DATA ANALYSIS PLAN (PDAP) was designed to stand alone as a usable document in assisting program managers to bring data to bear on their program management information requirements, the present document is intended to provide the supplementary background to the PDAP which will enable the prospective user to compare his own Special Education Program to that of Colorado and to gain some understanding of the process to be followed in the development of a PDAP tailored to his own needs. Thus, this document includes a description of the Special Education Program in Colorado and a "Process Guide" explicating the process to be followed in the development of a Program Data Analysis Plan. In addition, the document serves as a final report for the Colorado Phase of the developmental project, in that the Process Guide documents in detail the procedures involved in PDAP design and is based directly upon the process followed in the PDAP developed by Scientific Educational Systems, Inc.

Synopsis of Previous Related Work

The PDAP Project developed as the second phase of a study in support of State-level educational management performed by Scientific Educational Systems (SES) for the Ohio Department of Education, Division of Research, Planning and Evaluation, which acted as agent for the Joint Federal/State Task Force in Evaluation.[1] The PDAP Project is an extension of the work of two prior studies, the earlier of which was the Master Data Analysis Plan (MDAP)[2]. The MDAP was a study of reporting and analysis requirements for the Bureau of Elementary and Secondary Education's (BESE's) mandated reporting to

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[1] These activities were funded by the U.S. Office of Education through the Division of Intergovernmental Statistics, National Center for Educational Statistics under Contract No. OEC-0-71-1930(284)

[2] Specifications to meet BESE Mandated Reporting Requirements, Progress Report #3, Washington, D.C.: SES, September 1970. (Contract No. OEC-0-70-2406)

Master Data Analysis Plan to Meet BESE Mandated Reporting Requirements: Progress Report #4, Washington, D.C.: SES, October 1970. (Contract No. OEC-0-70-2406)

Congress. This Plan developed specific reporting requirements for the BESE Program Planning and Evaluation Unit and defined the analyses of Federal data necessary to meet the requirements.

SES then undertook a second study to develop a State-level Data Analysis Plan (SDAP) subject to several limitations in scope, as defined by the User's Guide Committee of the Joint Federal/State Task Force[3]. First, it was determined that the effort should be confined to the SEA activities related to program management. (The term "program management" was defined to exclude SEA internal management and legislative and policy planning.) Secondly, because of the need to enhance the generalizability of the product of the project, the development of a generic model, State-level data analysis plan was determined to be necessary. This generic model analysis plan was to be developed on the basis of the common program management information needs of several SEA's rather than those of only one. In addition, it would be construced at a level of generality that would allow other SEA's to use it as the core of their own analysis plans, constructed on the basis of their own needs.

The SDAP-Model I which resulted was a combination of three major components: First, a list of program management information requirements (questions for which answers are needed in order to manage SEA programs) for fifteen programs found to be common to three SEA's; second, the set of data elements necessary to provide the required information (not tied to specific forms or response options, and thus applicable to several SEA's); and third, the linkage of the data elements to the information requirements through the specification of the data analysis procedures necessary to answer the program management questions. This analysis plan, then, illustrates the type and extent of data analysis required to answer generic questions necessary to the support of program management activities. It forms a sound basis for the analysis of any one or more of the fifteen programs covered in any state.

From the generic model SDAP, work has now progressed to the development of specific Program Data Analysis Plans (PDAP's). The purpose here is twofold. First, applying the SDAP Model-I to a specific program in a specific state affords the opportunity both to refine and to illustrate

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3 The Development of a Model State Data Analysis Plan (SDAP)-Phase I. Final Report (Part I. Overview and Detailed Developmental Process; Part II. The Model I SDAP; Part III. The SDAP Data Compendium), Silver Spring, Md.: SES, December 1971 (Contract No. OEC-0-71-1930 (284)).

the Data Analysis Plan approach to the support of educational management. Second, application of the Model, in the form of a PDAP, provides directly usable results for any SEA which undertakes it. Present work will further enhance the utility of the PDAP concept by preparing PDAP's for application in three states (two of these for the same program). The Special Education program in Colorado has been analyzed and is the subject of the PDAP for which this document is a companion. Vocational Education PDAP's for Connecticut and South Carolina are also being prepared. These PDAP's will be of immediate use to these States in providing the information needed to make program management decisions.

In summary then, it can be seen that the present PDAP work is a natural extension of the concept of defining data support to management, applied to the more specific level of the information needs of a single program in a single state. In SDAP, the program management information questions were derived from the commonalities of management information needs across several programs and states. In PDAP, program managers were asked to describe their own information needs which were subsequently formulated into management questions. The data elements in SDAP were those elements, in general terms, necessary to answer the general management questions. The PDAP data items are specific items and options found on existing forms that when analyzed will specifically answer the management questions. The general level analysis of the SDAP is replaced in PDAP by statements of statistical manipulation and formulations of data from the actual forms.

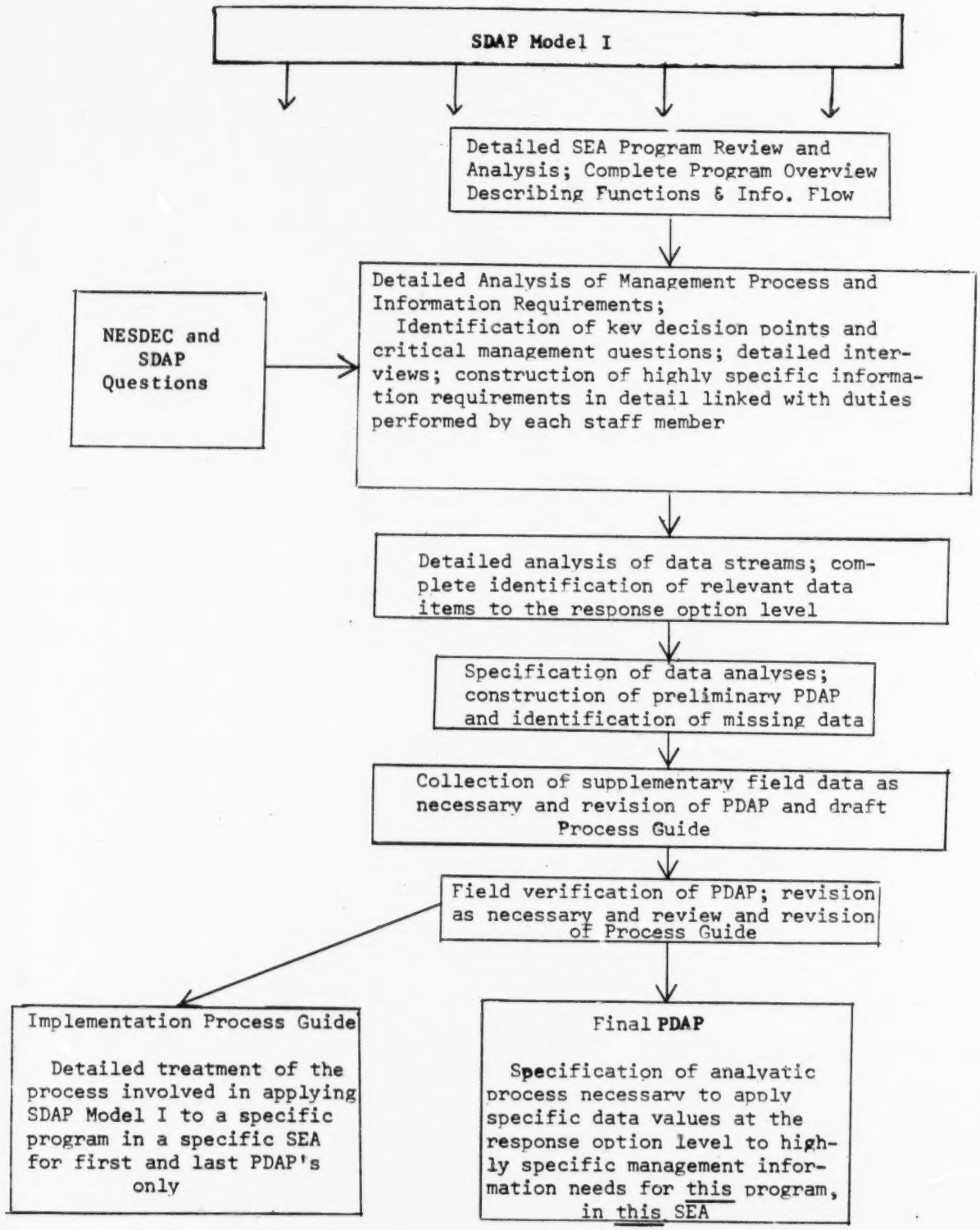
These characteristics of the PDAP mean that it can serve as the specification for manual data processing or computer programming. Thus, the PDAP is a working document intended to be of direct utility to the program manager in bringing information to bear on his managerial responsibilities.

Synopsis of Project Procedures

In general the procedures which were followed are those which are detailed in the Process Guide Section of this report, and to repeat them here would be superfluous. However, a summary of these procedures is perhaps in order. The procedures followed are outlined in Exhibit 1 below. It may be seen that the initial process focuses on the identification of the specific management requirements of the program. This was

Exhibit 1

Sequence for the Development of a
Data Analysis Plan for a Specific State and Program


SDAP Model I
Detailed SEA Program Review and Analysis; Complete Program Overview Describing Functions & Info. Flow
NESDEC and SDAP Questions
Detailed Analysis of Management Process and Information Requirements;
Identification of key decision points and critical management questions; detailed interviews; construction of highly specific information requirements in detail linked with duties performed by each staff member
Detailed analysis of data streams; complete identification of relevant data items to the response option level
Specification of data analyses; construction of preliminary PDAP and identification of missing data
Collection of supplementary field data as necessary and revision of PDAP and draft Process Guide
Field verification of PDAP; revision as necessary and review and revision of Process Guide
Implementation Process Guide
Detailed treatment of the process involved in applying SDAP Model I to a specific program in a specific SEA for first and last PDAP's only
Final PDAP
Specification of analytic process necessary to apply specific data values at the response option level to highly specific management information needs for this program, in this SEA

done by starting with the SDAP Model I as the organizing basis for the effort, feeding in the policy questions developed by the New England School Development Council, and soliciting the inputs of program managers at all levels. Careful analyses of these inputs permitted the statement of an initial set of management information requirements which was then discussed several times with program personnel. At the same time comparably specific material was collected regarding the data bearing upon the program, and all relevant forms were collected and analyzed. The interface of these two sets of specific elements was accomplished by the painstaking review of all possible data elements for each of the information requirements, followed by the explicit formulation of analytic procedures to be followed in applying the data to the answering of management information questions. Finally, these were again rechecked with program personnel for accuracy and validity.

Program Description

In order to make the PDAP developed for Special Education in Colorado of maximum possible usefulness, it was decided to describe the program in considerable detail. Thus, Directors of Special Education and Administrators in other states will be able to judge the similarity of the Colorado program to Special Education in their own states. In this manner they may decide how much of the Colorado PDAP may be directly applicable to their own programs, and judge the extent of additional work which may be required to adapt the PDAP and/or the SDAP Model I to their own programs, following the procedures described in the Process Guide found in the next section of this document.

Overview

Purpose and Authorization

The purpose of Special Education in Colorado "is to provide each handicapped child with the educational assistance he needs, so that despite his handicap he may pursue to the best of his ability the general goals of education that have been established for all children".[4]

The basic State legislation enabling the provision of Special Education services in Colorado is the Handicapped Children's Educational Act (HCEA) of 1965,as amended in 1969,1971 and 1972. Under this authorizing legislation, services are presently provided for children who are aurally handicapped, visually handicapped, physically handicapped, educationally handicapped, educable mentally handicapped, and/or speech handicapped. A new definition of the areas in which services will be provided is being prepared, based on learning disabilities related to receptive, integrative and expressive processes of the learner. This new definition should provide for a more effective identification of the population to be served

State Level Management and Organization

To work toward the achievement of this purpose at the State level, the Special Education program is managed by the Pupil Services

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[4] Special Education for Handicapped Children: Review of the Act and Synopsis of 1970-71. Denver: Colorado Department of Education, January 1972.

Unit (PSU) in the Colorado Department of Education (CDE). The Pupil Services Unit is charged with the responsibility for managing state and Federal programs for the handicapped children in public schools in Colorado. Programs outside of the public schools which are provided by the State are managed by the Department of State Institutions.

The PSU has operated as one of several units under the Associate Commissioner of the CDE. During the period of this study it has functioned under the direction of a unit director, and has been divided into two branches, Management Services and Program Services, with the following responsibilities, respectively.

For Management Services:

a. Provide assistance to school districts in establishing and monitoring data and information systems that meet Local and State needs and are compatible with the total systems being used.

b. Administer ESEA, Title VI-B. This includes assisting districts in writing proposals, providing consultation to districts conducting projects, coordinating with other unit, departmental and agency activities, and monitoring projects. (Since the completion of the Colorado PDAP, Title I-313-Administration has been added to PSU's responsibilities.)

c. Process program approval, reimbursement, and other such forms for the administration of the Handicapped Children's Educational Act.

d. Coordinate with Program Services the receiving, reviewing and approving of district plans.

e. Monitor the certification and endorsement of Special Education personnel that are employed by districts.

f. Set up and run a system for processing, analyzing, and using data.

g. Prepare unit budgets.

h. Monitor the fiscal aspects of existing programs.

i. Monitor progress toward the attainment of objectives.

j. Facilitate inter-unit cooperation and communication.

k. Facilitate inter-departmental cooperation and communication.

For Program Services:

a. Provide leadership to school districts in programming for handicapped children.

b. Provide leadership to school districts in developing a comprehensive plan to meet the needs of handicapped children.

c. Provide leadership to school districts in implementing a comprehensive plan. For example, setting up procedures for conducting identification studies of handicapped children.

d. Assist districts in providing continuing education programs for their personnel. This includes conducting special study institutes, granting of summer traineeships, and assisting in Local school district inservice.

e. Assist school districts in developing and maintaining an evaluation system. Special emphasis will be given to disseminating and implementing the ESEA, Title III model for evaluation.

f. Provide leadership in coordinating efforts of institutions of higher education.

g. Provide coordination with other agencies that provide funds and services to handicapped children such as:

(1) ESEA, Title III
(2) Vocational Education
(3) Vocational Rehabilitation
(4) National Institute of Mental Health
(5) Developmental Disabilities Council
(6) Mountain Plains Regional Deaf-Blind Center

h. Administer Learning Disabilities grant.

It should be noted that the structure of the PSU has been evolving to meet changing management needs as they arise. Although Management Service activities were formerly primarily clerical and administrative, and Program Services consisted primarily of services supplied by technical consultants, these distinctions are blurring under the pressures to provide a more effective, functional and systematic approach to the provision of needed services. Each consultant continues to be the resident expert in his specialty area, but consultants are now expected to plan for providing management and program services which cut across the handicap specialty areas. The PSU staff will work with LEA's to assess their needs for Special Education services, and help them develop individual district plans for providing these services. These district plans will then become part of a larger State plan for Special Education.

The PSU is adding the Guidance and Counseling unit and the Federally sponsored "Deaf-Blind" project to its Special Education

responsibilities. It should be remembered, however, that the PDAP development did not deal with these latter activities.

Modes of Service[5]

The services provided for handicapped children in the public schools are those implied by the list of responsibilities of the PSU given earlier. They are educational in nature, although related services such as assistance in vocational placement (Work Experience and Study programs) are provided. The continuous medical and related services are provided by other agencies.

Educational services can be provided in four modes: (1) in self-contained classrooms where handicapped children receive all of their instruction from a Special Education teacher, separated from the other children in the school; (2) in resource rooms where handicapped children go for special instruction from a Special Education teacher, though they return to the regular classroom and receive the remainder of their instruction with the other children; (3) by an itinerant Special Education teacher who visits the school periodically and provides instruction in a resource room; and (4) in the home or hospital setting where an itinerant Special Education teacher provides instruction for children who cannot attend classes in the school building.

The program description provided here deals only with those services which are managed at the State level by PSU. There are some additional services available in Colorado, which are not covered here. Educational services for more profoundly handicapped children are provided in State-operated schools and Community Centers for the Mentally Retarded and Seriously Handicapped. These schools are managed at the State level by the Department of State Institutions. Decisions are made at the Local levels between public school officials and officials from these State-operated schools regarding whether the profoundly handicapped child would most benefit from the public school or one of the schools managed through the Department of State Institutions. Services are also provided through the Deaf/Blind project, which is a special, Federally funded regional endeavor directed out of Colorado.

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5 Administrative Procedures for the Special Education Program. Denver, Colorado, Department of Education; January 1970.

Applications

Colorado is divided into 181 Local Education Agencies (LEA's). The LEA's apply for funds under the HCEA through the CDE to provide services to handicapped children in their districts. Some smaller school districts contract with other districts to provide these services or join with other districts in a larger administrative unit known as a Board of Cooperative Services (BOCS). There are 18 such BOCS's.

The LEA's submit applications for approval of these services. On the application, LEA's report staff to be employed, the services to be provided and estimated costs. The PSU checks the staff named on the application for the proper endorsement and certification, and for compliance with other guidelines. PSU then approves the program, and makes two prepayments of funds to the LEA's based on estimates of anticipated legislative appropriation. LEA's can claim reimbursement for 80% of salaries of personnel applied to Special Education services, 50% of transportation cost for handicapped children and 100% of foster home maintenance care costs for children who live and attend Special Education classes in a district other than their home districts.

Funding

Typically, the Legislature has provided less than full funding for Special Education services. Thus in the final analysis generally, LEA's are reimbursed for roughly 50% of the cost of providing services. The remainder of the costs are made up through Federal, Local and private contributions. Funds may come from a variety of Federal sources including Titles I, II, III, VI of ESEA, Title III NDEA, Indian Education, Migrant Education, Model Cities, NIMH, Vocational Education, and Vocational Rehabilitation. Vocational education and vocational rehabilitation funds are obtained for the Work Experience and Study Program (WES) for secondary school handicapped children. The Department of Education cooperates with the Colorado Department of Vocational Education and Colorado Department of Vocational Rehabilitation in managing this program. Each department contributes funds to the program.

Determination of Eligibility for Service

The LEA's provide diagnoses of children suspected of being handicapped to determine their eligibility for educational services accordingly. For children who are suspected of being educationally handicapped a parent's or guardian's permission must be obtained prior to diagnosis. A special committee designated by the Local Board of Education and approved by the PSU determines whether the handicap condition of the child meets eligibility standards for provision of service. Each committee for the handicap areas generally consists of a school administrator, a regular teacher, a supervisor or teacher in the handicap category, a psychologist, a social worker, and a physician. The committees are coordinated by the Director of Special Education or another school administrator. These procedures and the standards for eligibility for services in each handicap area are fully described in The Administrative Procedures for the Special Education Program.

Under the recent amendments to the HCEA, the State has committed itself to assuring that every handicapped child in Colorado receives educational services by 1976. To work toward achieving this goal, PSU is surveying the entire State to identify every child with a learning disability handicap. In addition, it will determine the cost of assuring that every handicapped child receives appropriate and adequate educational services. Therefore, PSU must identify every child who is now receiving service either through public programs supplied by State (HCEA), Local or Federal funds as well as those supported by private funds. It must also identify those who are not receiving services.

Detailed Discussion of PSU Functions

For those Special Education managers requiring more detail about the Colorado Program, the remainder of this Program Description is focused on functional details.

The responsibilities of the PSU can be grouped into a number of functional areas of program management covering both State and Federal programs. These are: Program Monitoring, Program Approval, Certification and Endorsement, Program Reimbursement, Program Development, and Program

Evaluation. Federal and State programs have separate reporting requirements and information needs, but in practice the planning and provision of adequate Special Education services require close coordination of Federal and State programs. The functions of State program management, and the information requirements and data needed for management purposes, are discussed briefly below. Management of Federal programs is discussed in a concluding section.

Program Monitoring

The function of monitoring the State programs in Special Education consumes a large portion of the time spent by program managers in PSU. The principle which guides the monitoring of on-going State programs is to allow the LEA's considerable flexibility in managing their own programs. At State level, general supervision of the conduct of these programs and the collection of data regarding on-going programs is required. Data are used to provide a baseline from which to plan for future services. (The collection of a large segment of these data is also mandated under the provisions of the 1972 amendment to the HCEA for determining the status of Special Education in Colorado.)

The main concern of the Management Services Branch of PSU is the development and operation of an information system which will provide the unit with the information required to monitor, develop, and evaluate its programs. The specific duties and responsibilities of the PSU in regard to providing data for program monitoring include:

1. Design a system which will provide personnel, pupil, costs, and revenue statistics as may be required by the Department.
2. Coordinate the Pupil Services Unit data system with central CDE systems.
3. Assist LEA's in the collection and reporting of data.
4. Analyze and report data information in a format conducive to the needs of the Unit and the Department.
5. Maintain a time line of activities, responsibilities and costs on a fiscal year basis which will be updated quarterly.
6. Submit quarterly progress reports of activities scheduled for completion during the quarter being reported.
7. Submit a yearly cost and revenue analysis of Special Education programs.

The primary requirements for information are in the areas of revenue, cost, pupils, personnel, and resources. PSU requires such data with reference to specific programs attributable to particular functional aspects of the program which are: administration, diagnostic services, Instructional Materials Center services, and other supporting services which exist in the Special Education area. PSU requires revenue and cost data for actual delivery programs which include the six basic categories of Special Education: Aurally Handicapped, Visually Handicapped, Speech Correction, Physically Handicapped, Educable Mentally Handicapped, and the Educationally Handicapped. Also needed are data on programs such as home-bound, home-hospital, WES, and the like.

In addition to requiring the types of data mentioned earlier on the kinds of programs just described, it is extremely important, particularly in light of the recent HCEA amendment, to be able to collect data in terms of the method of delivery of the services: itinerant, resource, and self-contained.

Program Approval

In order to qualify for State support (reimbursement), the LEA must submit a form to the Pupil Services Unit, entitled "Application for Approval of Special Education Services". The form presents a list of the personnel in the appropriate direct cost categories, and also the number of such personnel, and their salaries.

The specific duties and responsibilities of PSU regarding approval and reimbursement include the following:

1. Screen and make recommendations for the approval or disapproval of all personnel and salaries claimed for reimbursement under the Handicapped Children Educational Act.

2. Review the auditing and recommendations for the approval or disapproval of transportation, Home-Hospital, Home Instruction and other reimbursable items under the Handicapped Children Educational Act.

3. Review and monitor program quality as defined by State laws or Department regulations.

4. Give assurance that Federal revenue used in conjunction with State revenue does not exceed the Local expenditures for which those funds were allocated.

5. Give assurance that Local applications for reimbursement are in compliance with the Handicapped Children Educational Act regarding the limitations of reimbursement.

6. Advise Local agencies regarding the laws and regulations governing programs for handicapped children.

7. Maintain a close relationship with other Department Units relative to teacher certification, legal interpretations and data.

SEA approval of the LEA program in effect requires the acceptance of the LEA program with respect to personnel qualifications, endorsement and certification. Certification means that the applicant has met the general requirements for teaching in Colorado. There are two kinds of certificates: (1) an A certificate signifies certification for the first five years; and (2) a B certificate signifies ten years certification thereafter. The teacher must be certified and also endorsed as qualified in one of the six Special Education areas. Endorsement means that the individual has satisfied a course of study in one of the six Special Education areas in an institution of higher education which meets the joint approval of a series of review committees including representatives from institutions of higher education, LEA's, the SEA, PSU, and the certification unit in the CDE. The sequence of instruction is then reviewed by an advisory group and approved by the State Board of Education.

Certification and Endorsement

One of the duties of the Pupil Services Unit in this area is to aid teachers who are changing from teaching in the regular classroom to teaching in the Special Education classroom to achieve the necessary certification.

Several problems may arise in obtaining endorsed personnel in Special Education. For example, many districts have a need for teachers in a particular area, but cannot find a qualified ones. They write requesting a letter of approval from the Pupil Services Unit for a designated individual to fill a position on a temporary basis. This letter comes to PSU where it is examined and approved requiring that the teacher for whom a letter of approval is granted get nine quarter hours of relevant preparation during the ensuing year (from September to September). If the teacher does not obtain the required nine quarter hours during the ensuing year, the letter of approval is cancelled. The letter of approval must be renewed each year until, through the accumulation of sets of nine

quarter hours, the teacher reaches a point where an institution of higher education will endorse him in the regular fashion.

The Pupil Services Unit must check with the certification unit to determine the certification and endorsement status of the individuals listed on the application form. In many cases, the certification unit file contains only the endorsement and not the information as to whether the teacher is working in that particular endorsed area at the time. A further problem is that the computer file may not be suitably updated in time to be of use in this process. As a consequence, some members of the Pupils Services Unit keep their own card file. Other problems which bear on the updating problem and the review of the approvals is that in some cases, teachers may fail to get the nine hours and simply move to another district and ask for a new letter of approval without having completed the required nine hours.

Other activities related to certification not directly related to approval of programs are the basic responsibility of the Certification Unit of CDE. The Pupil Services Unit is only involved in the actual awarding of certification in the rare event that they are asked to review the credentials of an out-of-state teacher transferring into Colorado. All regular certification activities are handled by the certification unit.

Program Reimbursement

The fiscal monitoring function of PSU is mainly concerned with the processing of flow-through monies from the State's Handicapped Children's Educational Act (HCEA) to the LEA's at the present time. These flow-through monies are handled in the form of reimbursements only. Because of the requirement for reimbursement, only selected data have been collected related to this process. The data which would be necessary for complete accountability, for example, are not needed for reimbursement and, therefore, have not been collected.

Under reimbursement provisions of HCEA, the LEA's can be reimbursed for direct expenses, direct charges for certain categories of personnel. These categories include LEA level personnel which are Director of Special Education, Supervisors, Teachers, Speech Correction personnel, Special Teachers, Special Education Transportation, Psychologist, Social Worker, Psychiatrist, Home-Bound instruction, and Foster-Home maintenance. Certain

LEA expenses are not reimbursable under the provisions of the present law. These include equipment (except for Home-School equipment), materials, aides, clerical and secretarial support, administrative operation at the SEA level, physical and occupational therapist, school nurses and the like. Retirement cost under the PERA, (Public Employee Retirement Act) is also not included.

The major limitation on reimbursement is that no LEA should derive more than 100% of its Special Education salary costs from sources outside of the LEA itself. Although there is no state reimbursement for excess costs per se, it has been determined that a reimbursement of 80% of the previously described allowable direct costs are within a percent or so of the so-called excess costs of Special Education. Excess costs of Special Education are defined as the cost of educating a child in a Special Education program which exceeds the cost of educating a normal child in a parallel general education program. The LEA then makes up the additional cost of Special Education from a variety of sources, some of which include ESEA I, Vocational Education funds, Vocational Rehabilitation funds, NIMH, ESEA Title VI, ESEA III, and Local and State funds.

The determination of reimbursement funding under the Handicapped Children's Educational Act requires three steps.

1. Projection of Need. A projection is necessary since relevant, timely data are not available to meet the legislative schedule. The projection is typically based on figures which are two years old. The basic process requires the plotting of number of personnel going back several years and extrapolating a curve to predict the number of personnel which may be expected in particular categories for the ensuing year for which the projection is intended. The number of personnel projected is then multiplied by the average salary for that category times a factor of 5% predicted growth per year. Thus, for example, since the data for the last year are not available and data are being projected for the next year, the averages would be multiplied by 5% twice to make up for the two-year lag.

2. Legislative Appropriation. The legislative appropriation has historically increased from year to year. The Legislature is asking what improvements in Special Education can be expected for the additional monies which are being requested over and above the previous year's request. This is a very difficult question to answer, but PSU must attempt to gather relevant data.

A major thrust of the Pupil Services Unit's evolving responsibilities and activities concerns the problem of designing a data collection system, including the required report forms, to meet the requirements which have been imposed by the three recent Legislative Acts (PPBS, Comprehensive Planning, and Accountability), as well as the current "Mandatory Act" on educating the handicapped, House Bill 1060. In the past, budgets have been prepared by LEA's and by the SEA in a line item fashion in accordance with the OE Handbook II, Financial Accounting for Local and State School Systems, 1966. These line item budgets were quite satisfactory as a basis for the reimbursement procedure in which the Pupil Services Unit has been engaged in recent years. The data collection system and forms have not, however, provided the data which will be necessary to meet the objectives of cost accounting by pupil and program cost accounting which will be required in the context of the new legislation. The new system must meet these needs. In passing, it might also be mentioned that the present Colorado law mandates a full treatment of Special Education problems by 1976. It is also estimated that only approximately 50% of Special Education children are being served at the present time. This would augur a substantial increase in the Special Education effort in Colorado, if the mandate is implemented.

3. Allocation of Appropriations. Since the final determination of total reimbursable claims cannot be made until the year is over, and since monies are needed during the year, a prepayment is necessary. The Pupil Services Unit distributes approximately 80% of the appropriated funds to the LEA's around January of the school year. They then must encumber the remaining 20% by 30 June in order to avoid the problem of having unencumbered funds hanging over into the succeeding fiscal year. The major problem which arises in this process is the fact that the reimbursement claims are not received until around August following the school year and may not be processed by the Pupil Services Unit until sometime around September. Therefore, encumbrance of the remaining 20% in June must be on the basis of estimates derived from previous years' expenditures and any other information that may be available which bears on the topic.

Discrepancies are then made up by making appropriate adjustments in the prepayment for the next year.

Program Development

Under the impact of the recent Colorado legislation on Comprehensive Planning, Accountability and Programming, Planning and Budgeting, PSU devotes a major portion of its program development effort to meeting the requirements of this legislation. The main responsibility of the PSU in terms of development involves planning and budgeting for the establishment and continuation of Special Education programs. In this effort, emphasis is being placed upon planning and management by objectives, including assistance to the districts in the development of written objectives for their Special Education programs. Through workshops such as those recently conducted by PSU in 37 districts. At the same time work continues on the refinement of the objectives of the PSU itself.

In general, the program development activities of the PSU include planning and budgeting, technical consultation, and coordination with other agencies. Specific duties and responsibilities may be summarized as follows:

1. Identify population of handicap children needing services.
2. Develop and revise State Guidelines for Planning Special Education Programs in Local Education Agencies.
3. Develop a planning instruction which may be used by LEA's in complying with the State Guidelines.
4. Review and evaluate all plans submitted by LEA's.
5. Provide consultative services to LEA's requesting assistance in the planning of Special Education programs.
6. Submit recommendations for approval or disapproval of LEA plans with supportive documentation to the Director of the Pupil Services Unit.
7. Establish criteria for the approval of Special Education plans and amendments.
8. Develop a process by which the Department will develop district plans for those LEA's failing to develop their own plans by 1974.
9. Submit quarterly progress reports of activities scheduled for completion during the quarter being reported.
10. Provide technical consultation in the areas of Special Education.

11. Participate in the school improvement process concerned with planning and accountability.

12. Provide in-service training to meet specific needs for information.

13. Develop a State-wide plan for a Special Education Instructional Materials Center network that will provide for the needs for material.

14. Develop State guidelines for the development of Local or regional Instructional Materials Center.

15. Assist the Department in the dissemination of Special Education materials and information.

Planning and Budgeting. In the planning area, Colorado is responsible for developing a State Plan which is based on the various plans which are required from the LEA's as a prerequisite for funding. Further, a comprehensive plan for Special Education is required from each district by 1974. Each district which does not submit a plan for provision of Special Education services by that time must be provided with a plan by the CDE, prepared by PSU. Other planning activities take place in the context of the program approval and budgeting processes.

PSU is responsible for budgeting for its Special Education program. The budget preparation for CDE is coordinated by the Division for Management Services. The entire CDE budget becomes part of the Governor's Budget. The development and implementation of the Governor's Budget goes through the four stages below.

Stage 1 involves the preparation of the Governor's Budget. This entails assisting the various State Government Agencies in developing budgets for their programs. The second stage is known as the formulation of the budget. At this stage, the Governor's Executive Budget office determines the fixed commitments that have been set up on a long term basis and, by various information gathering activities such as surveys of salary needs, determines how the remaining funds should be allocated. The third stage involves presentation of the Governor's budget to the Legislature, supported by the testimony of representatives from each State agency and the private sector within Colorado. The final stage involves execution of the Governor's budget. Working closely with the State

agencies, the Budget Office reviews the differences between the budget passed by the Legislature and the budget proposed by the Governor, and translates the budget into an operational plan for conducting the programs of the State. Individuals within the various State government agencies are responsible for the funds appropriated and are charged with the responsibility of managing the programs according to the operational plans developed.

Technical Consultation and Training. Previously, technical consultants in PSU devoted considerable effort to transmitting technical information to Special Education personnel in the LEA's. This involved answering requests for consultative services over the telephone, by mail, or on-site in the LEA's. In line with its new emphasis and planning, PSU now attempts to determine the needs for LEA's for information and assistance and then plans for meeting these needs through training.

In this regard, PSU conducts numerous in-service training institutes, ranging from a few days to several weeks, in an effort to meet the requirements for development and continuation of Special Education services. Consultants work very closely together in determining the needs for in-service training in all handicapped areas. In the future the needs for training will be determined via statewide needs assessment.

The specific duties of PSU regarding training require the staff to:

1. Conduct all in-service activities for the Unit.

2. Instruct and inform Special Education administrators, teachers, and training institution personnel of the latest developments and opportunities for training of professional personnel under P.L. 85-926, as amended.

3. Coordinate all activities with the training institutions dealing with pre-service, in-service and post-service educational efforts in preparing specialists to work with handicapped children.

4. Assist in relating the manpower needs of the public schools to the training institutions.

5. Prepare the State Plan for training professional personnel, which will reflect the manpower needs in all areas of the handicapped.

6. Assist other members of the Department in planning and conducting in-service meetings within the Department or at Local levels.

Coordination with Other State Agencies. Two key areas in which PSU coordinates activities with other State agencies relate to the Special Education services to profoundly handicapped children and to the Work Experience and Study program. The first of these involves coordination with the Department of State Institutions was discussed earlier.

The Work Experience and Study program entails close coordination with the Colorado Department of Vocational Education and Vocational Rehabilitation. This program was mostly designed for the educable mentally handicapped child. Children who are educationally handicapped are now involved also, and children in physically handicapped categories are being added slowly.

The Work Experience and Study program provides work experience for handicapped children starting with in-school work experience in the 10th grade and out-of-school work experience in the 11th and 12th grade. Teachers who work in the Work Experience and Study program must have either an EMH or EH endorsement. The agreement was put into effect by legislation in 1968 entitled "Vocational Education Amendments".

Finally, of course, the PSU works closely with CDE in the preparation and submission of the budget to the Budget Office, as described above.

Program Evaluation

At present, State supported programs in Special Education are not evaluated on a formal programmed basis. Consultants have gathered and disseminated some information regarding the effectiveness of various instructional programs, techniques, and materials for educating different types of handicapped children. Data are gathered regarding the amelioration rate among handicapped children. (A child is "ameliorated" if he returns to the regular instructional program.)

Recently PSU like other divisions of CDE was charged with meeting accountability for the services being provided. In line with this, a research project funded under Title III is working toward development of a local level evaluation system for Special Education.

The work up to now in the project has involved development of a cost benefit model which is being applied in a small field test in a Colorado school district. The project involves identification of educational objectives including objectives of individual pupils. These objectives are arranged in a sequence to represent a developmental continuum in each of six areas. The areas are: physical, speech/language, human qualities, vocational/avocational, civic responsibility, and cognitive. As part of this project, assessment techniques were developed to determine which of the objectives students had achieved at some specified criterion level. Thus, a particular Special Education program in a specified district could be evaluated in terms of the percentage of objectives on each of the continua achieved by a particular percentage of children.

Other work, which is presently on-going, relates to development of ways of classifying information which flows within a school as well as the functions and roles that are performed by members of the school system. The purpose here is to identify and be able to classify areas of cost so that they can be labeled in terms of the class of function or role being performed in the school system. Four functions have been identified. These are: administrative/financial, specialized program development, supportive programs, and facilities. Work has progressed on this phase of the project to the point where objectives have been written for each of these four functions. Under these various functions, the roles of educators in performing the functions are identified. These roles are then specified in terms of the objectives which the individuals who fill these roles are attempting to accomplish. The final level involves identification of tasks, indicating how one goes about accomplishing the objectives. The model involves an analysis of input, process, and output. The input involves the information with which the individual fulfilling the role starts in order to achieve his objectives. The process part involves what the indivtdual would do to accomplish his objectives. And, finally, the output involves that which is achieved.

A program,planning, and budgeting procedure has been prepared which gets at the cost per child per program per classroom for the Special Education services. The Management Services division of CDE is concentrating on implementing a budgeting system which will permit PSU and others to

describe program objectives at the State level, plan for the budgeting of the objectives, schedule and accomplish the objectives, and periodically assess the entire program. The PDAP addresses itself to the information required to perform an evaluation of the Special Education program in Colorado.

Federal Programs

Most of the Federal involvement in Special Education in Colorado is through the Elementary and Secondary Education Act, Title VI. However, some Federal funds from Titles I and III are available for Special Education. When the PDAP was developed only Title VI monies were managed by the Pupil Services Unit while the Title III and Title I monies were managed by units other than PSU within the CDE. Since that time, the management of Title I has been shifted to PSU

The responsibilities of the consultant in charge of Title VI involve the general monitoring and reporting of the Federal program, including Title VI-B, VI-D and VI-G. His responsibilities cover the collection, analysis, publication and dissemination of data such as cost, revenues, and student and personnel data.

He works at both State and Local levels in the monitoring process. He prepares reports on the expenditure of the funds and the ways in which the programs are adhering to the Federal Regulations. This involves the use of contractual forms, vouchers, end-of-year reports, financial reports and reports on how equipment and supplies are being handled.

Although Title VI-B accounts for most of the funds, the PSU is presently directing a project funded under Title VI-G out of the Bureau of Handicapped, U.S. Office of Education entitled, "Child Service Demonstration Project." It is one of eight such grants funded by USOE for work in learning disabilities. The purpose of the present grant in Colorado is to attempt to replicate what has already been done in a model center in the State. At present, they are training two four-teacher teams. The purpose then, in following years, is to attempt to multiply the effect of this training by having these teacher teams each train two other teacher teams. In addition to this training, training packages are being developed and maintained at the Instructional Materials Center in Greeley, Colorado.

Fifteen percent of the Title III funds and 15% of the USOE discretionary funds must go by regulation to Special Education programs. The Special Programs Unit of CDE works very closely with the Pupil Services Unit in the development of research projects and demonstration projects under Title III for Special Education programs. The following is a description of the process:

1. Each year the needs in Colorado for educating handicapped children are determined. The Special Programs staff works very closely with the staff of the Pupil Services Unit in the identification of these needs.

2. These needs are communicated to the LEA's and proposals are solicited from them. During this part of the process, the Special Programs staff works closely with the LEA's in developing their proposals. The LEA's must send a letter of intent to the Special Programs Unit indicating that they wish to submit a proposal.

3. Proposals are then submitted by an October 1 deadline.

4. The Special Programs Unit then sends the proposals to outside readers who are knowledgeable in the various areas of handicap and/or knowledgeable in research and design. These readers meet and discuss the various proposals before they submit their final evaluations.

5. A Title III Advisory Council then reviews the proposals and makes final recommendations to the State Board of Education. This Advisory Council is made up of a wide scope of membership. The Special Programs Unit nominates people for positions on the Advisory Council and these must be approved by the State Board of Education as well as the U.S. Office of Education. The recommendations from the Board are also then reviewed by the Pupil Services Unit and the Special Programs Unit. Since it is a requirement that 15% of the Title III projects deal with Special Education, the Pupil Services Unit must verify to the USOE the labelling of Special Education projects by Title III monitors.

6. The Special Programs Unit then writes the grant award to the successful LEA's and the projects are initiated.

7. Under the direction of the Special Programs Unit, an annual on-site evaluation is performed for each project.

8. The various pieces of information concerning the project including the evaluation and report of the team and the proposal for continuation funding are submitted to the Advisory Council for recommendation regarding funding for the following year.

The ESEA Title I-313 funds set aside for the handicapped go to educational programs for handicapped children in state instituions. The Department of State Institutions has been designated as an LEA for the receipt of these funds. This Department is in charge of such areas as mental health and the treatment of the deaf, blind, mentally retarded, and the delinquent.

The Title I consultant has the responsibility for reviewing applications, monitoring programs, and for developing budgets for the program. He pays visits to the institutions to see if they are following the objectives specified in the applications. In connection with his duties as fiscal manager, the Title I consultant has devised a survey form which is used to determine the number of children in the institutions. This is, of course, necessary for the per pupil assignment of funds. The Title I consultant sends out guidelines describing what should be included in the evaluation report. Each institution submits an annual evaluation report on its Title I project.

Process Guide

This section is a "process guide" which describes the development of a Program Data Analysis Plan (PDAP) in support of the management of a state level educational program. It explains what a PDAP is, and presents a description of how one might prepare a PDAP for any program at the State Education Agency level. The guide is generally based on the background experience SES has gained through its earlier work in developing data analysis plans. Specifically, it is based on the PDAP development which has been performed for the Colorado Special Education program as managed by the Pupil Services Unit in the Colorado Department of Education.

The purpose of the "process guide" is to detail the procedures which may be followed in developing a PDAP. In this manner, it is hoped that interested parties in various SEA's or elsewhere may use the development of the PDAP for Special Education in Colorado as a model to guide similar developments in their own situations. It would be expected that such persons would have access to the PDAP itself as well as the present document. However, in the event that this should not be true, Appendix A to this document provides some detail as to the format and usage of the PDAP. This involves some duplication of the material which is found in the introductory section of the PDAP itself. This duplication seems necessary to make both documents of optimal usefulness.

Ideally, the SEA in the State of "X" should engage in the following process. First, it should obtain from the U.S. Office of Education or from Scientific Educational Systems, Inc., Volumes I and II of "The Development of a Model State Data Analysis Plan (SDAP)." These documents should be reviewed in order to gain full understanding of the Data Analysis Plan concept, and to choose the program(s) for which the development would be undertaken. Then, the present document should be carefully reviewed. If Special Education is to be dealt with, the program description should be studied to determine the degree of similarity (and thus carry-over) between the program in Colorado and that in State "X." The process guide section (below) should be reviewed to determine the nature and level of effort required for the development; the procedures (or

adaptations of them) to be followed; and the extent to which outside capabilities may be required to meet the requirements. Next, the PDAP for Colorado Special Education should be examined very carefully, for carry-over if Special Education is to be treated, and for format, scope, and usability, in all cases. Finally, if a decision is then reached to go ahead, the procedures outlined below should form a good basis for the development of a PDAP in State "X," even in content areas other than Special Education.

What Is a PDAP?

Every SEA is responsible for a series of related activities or programs through which it delivers money or services to the educational consumers of the state. Additionally, every SEA has a variety of managerial responsibilities associated with such programs. The Data Analysis Plan concept focuses on the identification of those items of information which a manager needs to meet his managerial responsibilities; on the available data sources; and on the ways in which such data can be put together or treated to provide answers to the information needs. The PDAP does this at a very specific level. It is a working document, intended to be of direct utility to the program manager. It is complete and specific enough to serve as the specification for either manual or automatic data processing routines necessary to manipulate collected data to answer management questions.

The core portion of the PDAP is an exhaustive chart showing the management questions, analyses, and data required for managing the program. The PDAP also contains, as an appendix, a list of the items comprising the data universe upon which it is based. Each PDAP should have as a back-up document, a comprehensive program description such as the one comprising the preceding section of the present document.

There are three columns in the PDAP chart. The first column contains the management questions; the second, the analysis statements and formulations; and the third, the data items utilized. The columns were arranged in this order to illustrate the concept that the analysis bridges the gap between the management questions and the data items. An overview of how elements in each of these columns were derived is provided below. A detailed description of the process by which these elements were derived is presented later in this section.

In the discussion below, the three columns are addressed in this order; management questions first; data items next; and analyses last. The management questions are discussed first since they are derived first, in order to identify the information needs of management. The data items are discussed next because as the PDAP is developed the analyst, after identifying the management questions, must next determine the data which are available on existing data forms to help answer the questions. The analyses are discussed last since the analyses required to convert the data into an answer can only be specified after the questions and data are known.

Management Questions

Management questions are those questions which the program manager asks in order to gather information neeessary to run his program. Once the data are collected and analyzed, the resulting information is used to answer the question, thus facilitating the management decision-making process.

The management questions identified for Special Education in Colorado were exhaustive and complete (see the PDAP). They were derived from extensive interviews with program managers in Colorado, as well as from analysis of the Special Education program, existing data, legislative requirements, job descriptions and duties, forms and documentation. Special Education program managers reviewed their job description with interviewers. Managers were asked to indicate the information which they needed to perform each duty.

Next, the managers were asked to relate these information needs to general level questions derived from the previously developed Model State Data Analysis Plan and from NESDEC (New England School Development Council) policy questions. The SDAP questions represented the general information needs of managers of Special Education. Similarly, the NESDEC questions were developed to represent policy concerns of state level managers, in the present case, related to Special Education. These general level SDAP and NESDEC questions were used in an overall structure for the final set of PDAP questions. (It should be noted, however, that while the SDAP questions are not essential to the development of a PDAP, the SDAP model was based on

the generic characteristics of 15 programs found to be common to several SEA's. It thus forms an excellent basis for PDAP development for any of the programs shown in Exhibit 2.

SES staff also made a thorough review of other written material which described the managerial process in Special Education in Colorado, including information which served as input to the decision-making process and information which resulted from the process. The information needs were then converted into management questions.

Data Items

Once the management questions were developed, SES staff searched existing State and Federal data collection forms used for Special Education. This was done in order to locate the data which, when analyzed, would answer the management questions. The "data items" column specified the exact location of data to be used in the analyses. It identified the exact items, options and cells from Colorado and Federal forms where required data were to be found. Where no data were presently available on Colorado or Federal forms, this fact was indicated.

Analyses

In the middle column, were placed the analyses of the data that would yield the answers to the management questions. The analysis statements consisted of a verbal statement of the analysis and, in most cases, a symbolic and mathematical formulation. Where no data were available, only a verbal statement of the analysis was provided. The data analyses were written to provide a specific and direct answer to each management question which was posed.

When completed, the entire PDAP with management questions, data and analyses was reviewed with Pupil Services staff of the Colorado Department of Education to assure its accuracy. Based on this review, such revisions as were necessary were made.

The PDAP Process, Step-by-Step

The development of the Colorado PDAP upon which this process guide is based required a period of roughly five months. The developmental strategy employed involved five periodic visits to Colorado, generally by a two-man team. Additional analytic work at the SES office utilized

EXHIBIT 2

COMMON PROGRAM DESCRIPTIONS

1. Bilingual Education Program
2. NDEA Title IIIA Program
3. Migrant Program
4. Management of General State Grants Program
5. School Assistance in Federally Affected Areas
6. Transportation Grants Administration Program
7. School Library Program
8. Driver Education Program
9. Vocational Education Services Program
10. Drug Abuse Program
11. Special Education Program
12. ESEA Title III Grant Management Program
13. Compensatory Education Program
14. School Food Services Program
15. Adult Basic Education Program

one or two analysts and one or two typists. The PDAP process described below is the procedure successfully followed by SES staff in developing the Colorado PDAP for Special Education. Where experience suggests a change in procedure, suitable modifications have been suggested. The step-by-step process followed by the SES team involved eight basic phases:

1. Plan and prepare for PDAP development.
2. Develop program description.
3. Review description and identify information requirements.
4. Develop management questions
5. Prepare PDAP chart.
6. Review PDAP.
7. Revise PDAP.
8. Verify final PDAP and prepare for final production.

The specific steps to be followed in each of these major developmental phases are described below.

1. Plan and Prepare for PDAP Development

1.1 Plan Strategy (Objectives and Procedures for Study).

To assure the most effective use of available staff and time, develop a management plan prior to initiating the study. This plan should supply guidance but should be flexible enough to permit alterations in the developmental strategy as necessary. The key elements and steps in such a management plan may be derived from the step-by-step description of the developmental procedure given below.

1.2 Obtain Necessary Clearances.

It is highly important that all those personnel in the chain of command be aware of the study development and its purposes, usually including the Chief State School Officer. It may not be necessary to secure formal clearance from all such persons, but it is imperative that the unit director for the program being studied, or his superior, make it known to all concerned that the development of a PDAP for this program has active approval and that cooperation of all staff is urged.

1.3 Collect Available Overview Documentation.

The effort involved in this step will vary depending on the amount of data available from previous similar efforts such as SDAP and

the degree of familiarity of the analysis team with the organization to be studied. The analysis team should get or devise an organization chart. They should review documentation which describes the general functions and goals of the organization, the program to be studied, and the units responsible. It is important that the analysts should assure that documentation which they collect is the most recent available, updated as necessary.

2. Develop Program Description

The tasks described here are performed during the initial round of interviews and information gathering activities.

2.1 Brief Appropriate Personnel on the Purposes and Plan of the PDAP Development.

It is quite important that the staff of the organizational unit for which the PDAP is being developed understand the purposes of the PDAP and the plan which will be followed for its development. These personnel are critical to the developmental process since it is from them that the information needs will be identified, and in turn it is their information needs which the PDAP must serve. Therefore, these personnel should be briefed thoroughly on the purposes and plan for the PDAP development. This task can probably best be handled by meeting with the key personnel in the organization, disseminating a written description of the PDAP study to all staff and then explaining the study individually to each staff member as they are interviewed the first time. It is important that all questions be answered to the satisfaction of the staff members.

2.2 Identify all Staff to be Interviewed and Interview Them.

During the initial round of information gathering, analysts will identify all appropriate members of the unit to be interviewed. Generally, this will involve all professional personnel in the unit being studied. As these interviews are conducted, analysts will learn of others within the unit as well as personnel outside the unit who should be interviewed. Interviews with those outside the unit will be discussed in a later part of this section.

Analysts must use their judgment in conducting interviews. Obviously, some interviews will be more productive than others, and

it may be difficult to determine in advance which will be most valuable. Within the time available the analyst should determine how much useful information he can get from the interviewer and not extend the interview any longer than necessary. Generally, it is probably better in most cases to conduct several hour long interviews than one marathon interview.

The first round of interviews are intended to introduce the unit's staff to the study and to gather from them:

a. Their structural position within the organization;
b. Their purposes and functional roles;
c. Identification of individuals with whom they interact;
d. General information which flows between them and those with whom they work;
e. Written job descriptions, data forms and other documentation.

The principles of effective interviewing techniques cannot be discussed in detail here. However, the interviewer should be a trained, skillful analyst/interviewer. He must assure the staff member of the importance and validity of the study being conducted. He should focus on the benefits the staff member may expect as a result of the study, and attempt to mitigate the personal threat which is often perceived by interviewees in such situations. He must ask important questions in an effective manner, and be skillful at probing for the full picture in response.

Various techniques are available for recording interviews. SES found it effective to take notes during interviews, and then at the end of the interview day to tape record a summary and review of the interview. The level of detail to be recorded from the interview can be determined by the analysts. It obviously is better to tape more detail than is needed and throw out material later. Once transcribed, the notes on the interviews provide the critical record needed for describing the program and writing the management questions. This method is particularly effective when working with lengthy interviews since it would require great effort to get the pertinent details from a direct tape recording of the interview session. Fairly long interviewing times were sometimes necessitated by the complexity and amount of detail entailed. The practice of recording a summary of the interviews on the same day in which the interviews were conducted was found to be effective in

producing little loss with respect to comprehensiveness. This procedure made up for the disadvantage of not having tape recorded interviews. It was also felt that the absence of a tape recorder during the interview itself was influential in producing a candid discussion of some sensitive issues.

It is important that this process take place the same day, however, before interview notes get "cold" and layered over with subsequent interview material.

2.3 Gather Documentation.

The PDAP analyst must always be alert to collect all relevant documentation. Those staff members with whom the analysts will be working may fail to provide all pertinent documents since they work with these documents daily and may overlook their importance to the PDAP study. Thus, it is critical that the PDAP analyst listen carefully and doggedly request any documents, forms, etc., that may be mentioned. He must also probe for the existence of other documentation which has not been mentioned but which may prove relevant. Although the analysts may collect some irrelevant documentation this way, it is particularly important to get whatever is available since the relevance of some documentation may not be clear until later in the PDAP development.

The types of documentation which should be gathered include:

a. Purposes of the program

(1) Relevant legislation (State and Federal);

(2) State plan for program activities;

(3) Other documents describing objectives; and

(4) Guidelines for evaluation of programs.

b. Functions of the organization

(1) Job descriptions including an elaboration of duties performed and amount of time devoted to each duty, if possible; and

(2) Other documents which describe the functions of the organization.

c. Procedures

(1) Documents describing administrative procedures such as administrative guidelines for applying for funds under the program;

(2) Forms used to transmit information within the system; and

(3) Documents describing evaluation procedures.

d. Program description

(1) Documents describing the scope and size of the program (Number of staff, students, programs, etc.)

e. Reports

(1) Federal, State and other internal program reports

f. PPBS and cost-effectiveness documents bearing on the program

2.4 Interview Other Personnel Outside the Unit.

The same general rules apply to interviews with these individuals as apply to interviews with personnel within the unit where the study is being performed. However, the key purpose of these interviews is to gather their views of the interactions which they have with the staff of the unit being studied. The analyst should collect enough information about the total functions of these other personnel to place the interaction with the study unit in context, but need not be exhaustive in most cases. The types of organizations in which these other personnel may work may vary widely. Then interviews may be conducted with personnel in the:

1. Planning unit (including PPBS)
2. Office of top administration (such as the Commissioner, Associate Commissioner, or other officials under whose jurisdiction the study unit falls)
3. Information systems unit
4. Certification unit
5. Management Services unit
6. Teacher Education unit
7. Evaluation and Assessment unit
8. Budget Officers in and out of the Department of Education including the Governor's Budget Office
9. Legislative branch (legislators and their staff)
10. Program units in LEA's
11. Teachers and other staff
12. Office of special projects having a bearing on the study
13. Units which may administer Federal programs involving the study unit
14. Other appropriate state agencies such as: Department of Vocational Education, Department of Rehabilitation, Department of State Institutions, Department of Welfare and Social Services, etc.

15. State Board of Education

16. Local Boards of Education

In addition, analysts may wish to interview recipients of services (students and parents). Again the utility of interviewing any one of the individuals referred to above must be determined by the analysts.

2.5 Analyze Documentation and Interviews and Write Program Description.

The amount of information required before beginning analysis and the development of the program description will vary with PDAP studies. For clarity of presentation, the process is described here as two steps. However, in reality these two steps may involve several iterations of each.

These iterations will involve going from more general information and description to more specific information and description. Additionally, analysts may wish to divide a particularly large program and perform these steps on each segment of the program separately. The reader should be cautioned that when the latter approach is used the information gathered separately must be integrated for the entire program from time to time.

The purpose of the analysis of the information which has been collected is to organize it and extract from it the purposes, functions, procedures and decision-making processes involved in the program administered by the study unit. The description developed should explicate in detail the information flow into, out of, and through the study unit. To serve this purpose, the description highlights the information flow, but in total it includes:

a. Legislative authority for program

b. Purposes and goals

c. Functions

d. Procedures

e. Decision-making processes

f. Information flow

Ultimately the program description provides a vehicle for the study unit staff to review the PDAP development; background understanding for project staff to use in developing management questions and analyses, and a basis for other SEA's to use in judging the similarity of their programs to that for which the PDAP was developed.

3. Review Description and Identify Information Requirements

3.1 Review Description with Staff

Prior to finalizing the program description, each member of the study unit staff and others interviewed should review that segment of the

document to which they contributed and offer revisions as needed. If an effective job has been done in describing the program, staff members will gain confidence in the study as well as new understanding of its purposes.

3.2 Discuss Job Descriptions with Study Unit Staff and Gather More Detail as Needed.

Focus in on the job description for each staff member. Carefully elaborating his specific duties is important to the process since it is the statement of each duty to which the analyst will later need to relate information needs.

3.3 Have Each Staff Member Identify the Information Needs Related to Each of His Duties.

Working with one duty at a time, each staff member should be asked to identify that information which he requires to perform each of these duties. This procedure will work more smoothly with some individuals than others. Some program managers are more accustomed to thinking in terms of gathering and analyzing information as part of their jobs than are others, e.g., a program manager whose duties are statistical in nature rather than consultative will be more accustomed to thinking in terms of information requirements. It is wise to enter each interview with a notion of some information requirements which the manager has for each duty. When the manager seems at a loss to identify information requirements, the interviewer might suggest a possible requirement to prime the manager's thinking. This procedure of course must be used judiciously so as to avoid leading the manager, too much. The basic principle must be remembered that the interviewer-analyst is asking the manager to tell him what his information requirements are. He is not asking the manager to confirm the interviewer's suspicions of what the manager's information requirements are. One method found effective in tracing the flow of information involves the use of a form analysis sheet. This data collection method allows the interviewer to identify the source date of submission, persons who prepare and receive forms and, most importantly, the use (if any) to which each data item is put. This method is an excellent one for incoming not so obvious information requirements.

3.4 Relate Available General Level Management Questions to Duties.

The New England School Development Council (NESDEC) policy questions and Model I State Data Analysis Plan (SDAP) questions provide general level management questions for program management at the SEA level. As such, they can act as one source for classifying at a later time the

specific level PDAP management questions which are developed as a product of the study. This classification process is described in more detail later in this process guide. To aid in the later classification process, it may prove useful at this point to have each program manager review the relationship of each of the SDAP and NESDEC questions to each of his duties.

3.5 Collect Additional Information.

Further discussion with program managers may uncover additional relevant forms and documents. These should be collected and analyzed as needed.

4. Develop Management Questions

4.1 Review Information Requirements.

Next the analysts will review the information requirements which have been identified, consolidate similar requirements, and develop a comprehensive set of all information requirements.

4.2 Write and Review Management Questions.

Select a sample of the information requirements and write each in the form of a management question. Prior to writing management questions for all information requirements, it is wise to review a sample set of questions with the entire analysis team. Although relatively simple, the conversion of the information needs into questions is important. It is at this point that the analysts develop the first of the three elements which make up a PDAP. This element, the management questions, is the most important of the three elements of the chart. It is closest to the heart of the function of the program manager. As such it is his entry into the chart. If the management questions represent what he needs to know, he is considerably more likely to use the PDAP than if they do not. Additionally, the management questions must withstand the test of time. The other elements, the data items and analyses are more likely to change as forms and other data sources change. But the management questions will stay the same until the information requirements change. It is obvious from analyzing program management, that information needs are much less likely to change significantly over time than forms and other data sources.

Thus, great care must be exercised in writing management questions. They must:

a. Reflect the information needs (most critical);

b. Be as simply and understandably stated as possible;

c. Be sufficiently precise to permit the development of data analyses relating the data to the question.

The review of the analysis team should help in this process. Of course, whether the questions meet these requirements can only be determined after review by the program manager (discussed later). The analyst must be careful not to allow the data items and forms to dictate the management questions, since in many areas data items are not used by managers and do not represent information needs. The data items on forms can best be used to aid in clarifying an information requirement which was not adequately explicated earlier.

4.3 Review Legislation, Forms and Other Documentation for Additional Sample Questions.

By this time the analysts will be knowledgeable about the information requirements of the study unit in general. However they will also want to review legislation, forms, etc. which have been collected for additional sample management questions. This procedure is followed in the interest of developing a comprehensive set of questions.

4.4 Write Additional Management Questions.

Once the analysis team is satisfied that the sample management questions are adequately written, the remainder of the information requirements can be converted to questions. These management questions can be written one or two per page, on large sheets (about 11" by 17"), in a column labelled "management questions." Space is left for two other columns for the analysis and data items to complete the PDAP chart.

Preparing the chart with a small number of questions per sheet allows for sorting questions into whatever arrangement desired. As the analyst is developing management questions, an organization for the questions may suggest itself. However at this point, the questions should be placed in an order which will permit the efficient review of the questions by each program manager.

The final organization of the questions must wait for later discussions with program managers, and will likely be along the lines

of the functions performed by the different program managers. The final organization of PDAP questions used in Colorado is shown under Section 7, below.

5. Prepare PDAP Chart

Attention turns now to identifying data items and writing analyses for the management questions. In order to represent the content and location of the data items found on Colorado Special Education forms, the SES analysis team developed a simple but effective system of notation used to permit the statement of the analyses themselves. This system is described in the introduction to the PDAP, and is also reviewed in some detail in Appendix A of the present document. It should be noted that this, or a similar system, is essential to the format of a PDAP if it is to be a usable document.

5.1 Annotate Forms in Accordance with System of Notation.

The forms used for collecting data constitute the basic data element universe within which the analysts locate data items and develop analyses. In preparation for using these forms, they should be annotated in accordance with the system for representing data. In most cases, this involves assigning item numbers to items on the forms which do not carry numbers and labeling the columns and rows of matrices on forms which are not labeled. A sample of this annotation is shown in Figure 2. appearing in Appendix A to this document.

5.2 Prepare Data Item List.

In accordance with the data representation system, prepare a complete list of data items used on all forms collected. The data item list should eventually be included for reference as a part of the PDAP, probably as an appendix. The basic rules and procedures used in preparing this list for Colorado were as follows:

> The data list provides the location of the data used to provide the answers to the management questions in the PDAP. This information was gathered from every Colorado Special Education form and those Federal and State forms utilized by Colorado Special Education. Each "data item" is the specific location (item identification) of a specific datum that is to be used to answer management questions. Each item in the third column on the PDAP chart of management questions is reflected in the data list so that every data item has a unique designation. The following conventions were used:

NIN's 1. All items not numbered on the form were designated NIN (no item number) and assigned a number.

Matrices 2. All groups of items appearing in matrix form or those most easily identified in matrix form were listed as columns by rows, permitting direct access to individual cells within the matrix.

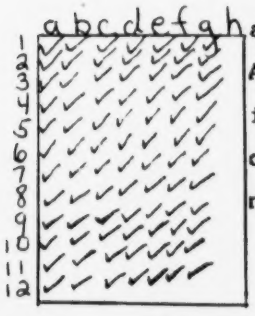
Blank Cells 3. When a cell of a matrix appeared for which no information could be gathered, it was identified as a blank cell at the end of the matrix.

/ 4. The symbol / was used within items to identify response options from which one may be chosen when the form is filled out.

(✓) 5. The symbol (✓) was used after an item which is answered by checking or not checking.

($),(#) 6. The symbols ($) & (#) indicated the type of information requested when not immediately apparent.

✓ 7. A ✓ over an item or in the left margin indicated that the item or items were used to answer one or more management questions in the PDAP. Items that were not checked were not used to answer management questions.



A chart in the left margin indicates which of the items found in a matrix was utilized to answer one or more management questions. Matrices that were not charted or checked were not used to answer management questions.

5.3 Write General Analytic Statements.

As with the writing of management questions, the completion of the data items and analyses should be prepared on a sample basis and reviewed by the analysis team. The team should review the analyses and data item in terms of their capacity for answering the management questions. These review procedures apply to Steps 5.3 through 5.6.

The first step is to write a general analytic statement which defines the basic parameters of the management question. The parameters specified will guide the search for data items.

5.4 Locate Candidate Data Items.

Locate data items which it is believed will provide the data which when analyzed will answer the management questions. This may involve more than one set of data items. If no data items can be located, note this in the data item list by indicating "None available."

5.5 Evaluate and Select Data Items.

Evaluate the candidate data items in terms of their capacity to meet the parameters of the question. Select the best data items. Record this item in the data items column in the form specified by the system. Record just below the data item the data found in the location represented by the data item, that is, the type of data found there. The data items might specify item #15b and the data found there would be shown as "Number of students."

If none of the data items meets the requirements of the management questions, search the form again if this is considered likely to uncover an applicable data item. Otherwise, record "None available." Note that the type of data, such as "Name of students" is indicated even if the data items are not available on existing forms. (The data needed for the analysis was apparent, but they were just not present on existing forms.)

5.6 Write Specific Analytic Statements and Formulas or Revise General Statements.

For those management questions for which data items were located, write specific analytic statements and formulas. The formulas take the data items located and describe in a very specific way how these items are manipulated to provide an answer to the questions. The verbal analytic statement should describe in words the algebraic manipulation represented by the formula.

For those management questions for which no data items were found, the general analytic statements should be reviewed and then revised to provide general statements of how data might be collected, where possible, and then analyzed.

5.7 Locate Data Items and Write Analyses for Additional Management Questions.

Once the analysis team is satisfied that the procedures are producing effective answers to the management questions, perform steps

5.3-5.6 above for the remaining management questions. The PDAP should then be typed in draft form.

6. Review PDAP

6.1 Review Applicable PDAP segment with Each Staff Member.

Return to each staff member and review with him the management questions, data items and analyses which apply to his functions. Explain thoroughly the system which has been developed. Solicit from the program manager suggestions for revisions in the PDAP. Attention will focus on the management questions. It is here that the program manager can be of most help. The data items which have been located and the analyses which have been written are likely to be accurate and depend on the validity of the management questions for their own validity. However, the manager should be asked to review all three columns of the chart. Particularly, the manager should be asked to look at the questions for which no data items could be located to indicate whether in fact data items do exist within the forms being used.

The manager should also be asked to suggest any new management questions which he believes are missing. Ask him to suggest possible data items and a general analysis.

6.2 Review Entire PDAP with at Least One Staff Member.

Review the entire PDAP, with at least one program manager who has overall responsibility for the unit being studied. Have him perform the same review as described in 6.1 above. Also discuss how the PDAP questions should be arranged. Indicate that it is important to have the questions organized so that program managers can locate the questions to which they require answers. In Colorado, an organization was suggested which generally follows a classification of questions by functions of the unit.

7. Revise PDAP

7.1 Revise PDAP Content.

Based on revisions suggested by reviews, revise and/or expand the PDAP. Add new management questions as necessary; locate data items; and write analyses in accordance with procedures indicated in Phase 5.

7.2 Reorganize PDAP Questions.

The reorganization of the PDAP questions should be guided by the specifications laid out by the program manager(s) in step 6.2 and supplemented as necessary based on the organization suggested by the

NESDEC and SDAP policy questions and the knowledge gained by the analysts while analyzing the program management of the study unit.

The PDAP management questions in Colorado were organized into seven major sections corresponding to the seven areas into which the program management functions of Special Education in Colorado are divided. The first six of these relate to State program management and the last to Federal program management. In practice Federal and State programs are closely coordinated; however, these programs have many separate reporting requirements and information needs. Separate sections are provided for State and Federal programs to assure comprehensive coverage of both areas. In addition, management questions are provided for those areas where information needs overlap.

The seven sections into which the Colorado questions were divided are:

State Program Management:

a. Program Monitoring

b. Program Approval

c. Program Reimbursement

d. Certification and Endorsement

e. Program Development

f. Program Evaluation

Federal Program Management:

g. Federal Programs (Monitoring, Development and Evaluation)

For both the State and Federal programs, these sections cover the general management process through which programs are planned, implemented, conducted and evaluated.

Several of these seven major sections are further subdivided into more specific areas. The detailed classification of all management questions is shown in the "PDAP Chart Contents."

7.3 Integrate SDAP and NESDEC Questions with PDAP Questions.

Review the SDAP and NESDEC questions and integrate these with the PDAP management questions as general level questions subsuming the specific level PDAP questions. This integration process should be based on:

a. The information gained from the association drawn between the NESDEC and SDAP questions and the information requirements (now in the form of PDAP management questions) by the program manager;

b. The information the analyst has gained as he has analyzed the program management in the study unit.

In the Colorado PDAP for Special Education, the applicable NESDEC and SDAP questions are listed at the beginning of each section of the PDAP. For each section, these are the general management questions, which are addressed by the specific PDAP management questions in that section.

8. Verify Final Draft PDAP and Prepare for Final Production

8.1 Verify PDAP with Study Unit Staff.

Review the final draft PDAP with study unit staff seeking verification that their suggestions have been incorporated and errors corrected. Revise as necessary. At this stage these should only be minor revisions. Also review the organization of questions with key program manager(s) to assure its usefulness.

8.2 Prepare PDAP in Final Form.

Prepare the PDAP in final form. The final PDAP should including the following items:

a. PDAP
b. Data Item List (Appendix)
c. Program Description (Appendix or separate)
d. Annotated forms (Appendix or separate)

Some Notes on Using the PDAP

By employing a PDAP, a program manager who has a need for information can locate a question identical or comparable to his own. He can then ascertain from the third column where the data may be found on existing State or Federal forms, manipulate the data according to the directed analysis and arrive at the information he needs to make his decision. For example, the program manager of Special Education in Colorado may be concerned with planning for future development of the program and have a need to know what increases in resources will be necessary. The manager can find in the PDAP the exact question being posed or a comparable question which will supply the information he needs. The PDAP chart is ordered so that all questions on a particular function are found together. The Table of Contents for the PDAP chart lists these sections under various headings and sub-headings. The data used in the analysis are found in the third column and because their specific item numbers are used in both the analysis and data column, they can readily be found on their designated forms and actual data, such as, number of teachers and numbers of students can be substituted in the formula. These data might be used in analyses to determine the number of staff, and additional budget necessary to meet the projected needs, for example.

Over a period of time, some changes in a PDAP may be required. As State forms are changed and revised, the item number of a particular piece of data may change. This necessitates a change in the data element list and the analysis formula. However the narrative analysis statement remains the same since the logic of the analysis and the data required remain the same. Only the location of the data changes. For example the data to answer a question regarding the number of students and number of teachers remain the same however the location of these data on the form may change. Data element lists and analysis formulations will require frequent updating. Management questions and narrative analysis statements will need revision only as the information needs of the organization change. For example, if reimbursement is no longer a function of the program manager, those questions are no longer relevant in the PDAP. If reimbursement is carried out in a different functional manner, questions must be revised or written anew as necessary. The Process Guide is the blueprint for such activity.

Also, the PDAP and Process Guide can be extremely helpful in revising forms. As noted above, questions for which no data are available have been

identified. By following the process of deriving management questions, asking what information is needed to make a decision and formulating it into a question, the data needed to answer such questions become apparent. Forms can then be constructed to gather the information.

Finally, the PDAP has been developed so that with a little experience it can be used by itself with only occasional reference to supporting documents such as the Data List. The data item column not only gives the data item number on the form being used but also names each datum being manipulated. With a little practice, managers can use the chart directly, since it is relatively simple and straightforward. At the same time the PDAP has all the characteristics of a complete specification for computer implementation and forms an ideal basis for an automated management information system.

Appendix A

Description of the PDAP Format, Contents, and Usage

The component parts of the PDAP are described in detail below for the use of the reader not having access to the PDAP itself. The figure on the next page shows a sample management question, analysis and data item set from the PDAP chart. On the page following this sample chart is a page from the form referred to in the sample PDAP chart items. Beside each key element in the sample chart is a reference number such as (1) which corresponds to the same number in the following narrative, and indicates the element in the chart to which the discussion is addressed. In addition, the same applicable reference numbers appear on the sample form following the chart.

Each management question (1) represents a specific information need, in this example, "What was the closing enrollment of handicapped children in all Special Education?" In the data items column (2), the data items are in a form allowing each item to be specifically identified. The first position in the data item column indicates the Colorado Department of Education or Federal form number on which the item appears. In the example provided, all items come from CDE 148 (3). (The complete PDAP covers <u>all</u> relevant forms.) CDE 148 is actually a collection of several forms. These forms within CDE 148 are indicated next in the data item column. The sample item on the chart is drawn from Form I of CDE Form 148 (4).

Generally, CDE forms are not a collection of forms and so the data item (5) in parentheses usually directly follows the form number. The data item (5) is the entire series of symbols within the parentheses taken together, and indicates the location on the form of the actual data to be substituted in the formula for that particular analysis. To fully locate the data item from which data will be gathered any number of dimensions may be specified. Each of the symbols within the parentheses represents a dimension which helps locate the data item on the form. Each dimension is set off by commas within the parentheses. These dimensions designate where on the forms the information is to be found. For the sample data item drawn from Form I of CDE 148, the first symbol in the parentheses (6) identifies the column in the "matrix" on CDE 148 in which the data item appears, in this example, column I. The

Sample PDAP Chart Item

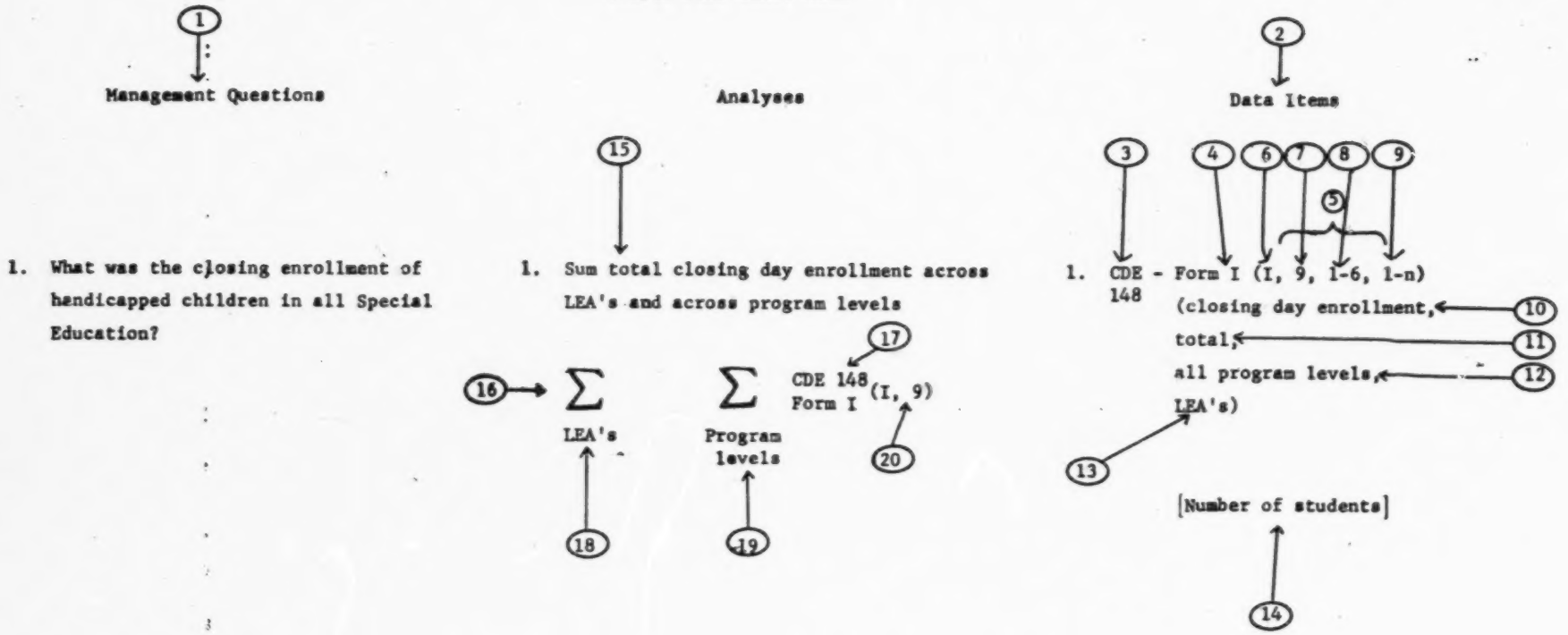
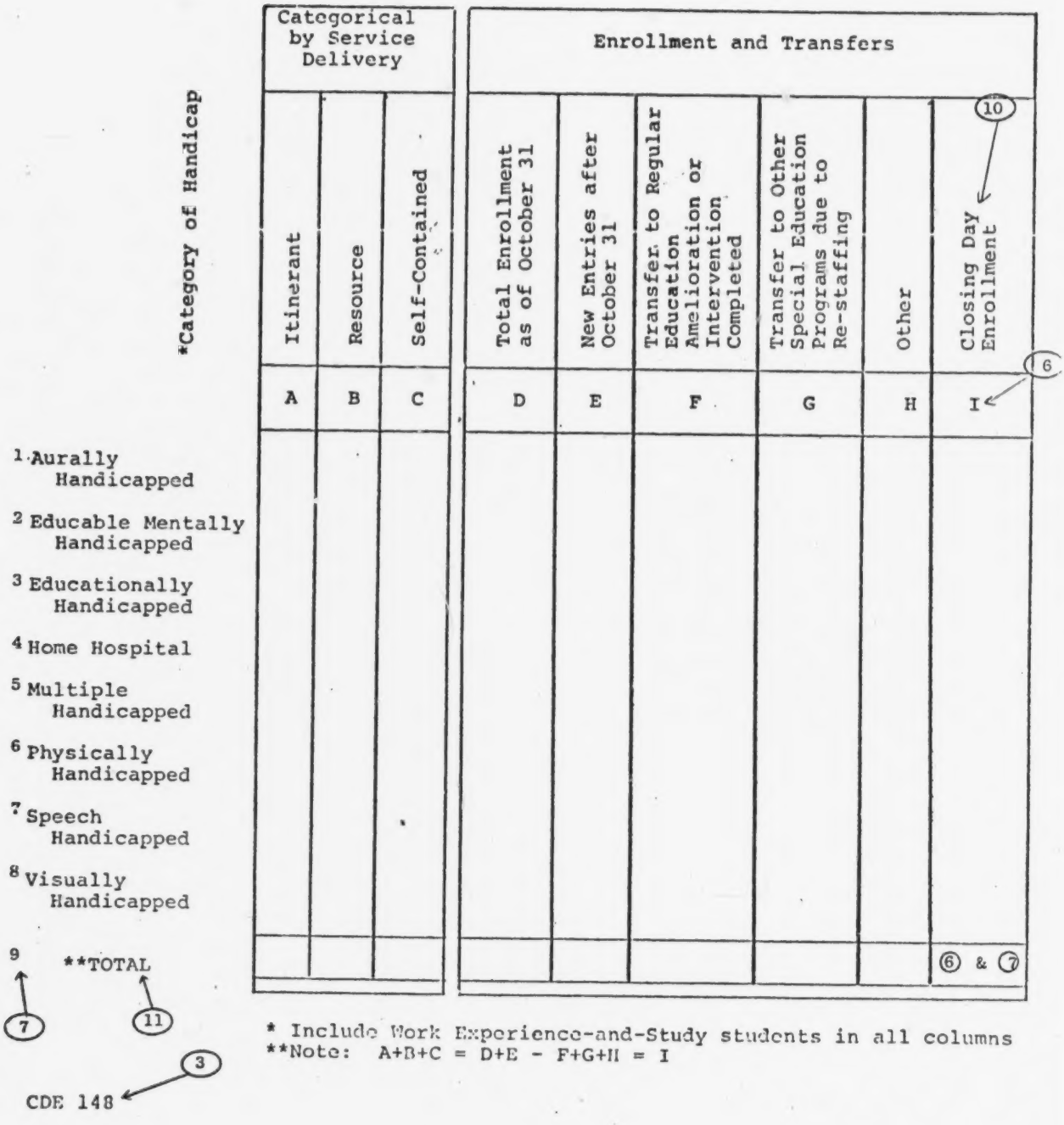


Figure 1. PDAP Chart Example

(4) → Form I
(12) → Pre-school (other identical pages provided for other five program levels)

STUDENT ENROLLMENTS IN SPECIAL EDUCATION PROGRAMS



* Include Work Experience-and-Study students in all columns
**Note: A+B+C = D+E - F+G+H = I

Figure 2. Sample Form

second symbol (7) defines the row of the "matrix" in which the data appear, in this case row 9. Therefore the first and second symbols together define the cell, that is, the intersection of the column and row, where the data are found.

It is apparent for this sample data item that there are also a third and a fourth identifying dimension which further locate the data item on the form. The third (8) is a dimension showing 1-6 categories and the fourth (9) a dimension showing 1-n categories. The entire set of symbols enclosed in parentheses (I,9,1-6,1-n) (5) represents a single data item, on the form indicated; no more, no less.

Directly following the data item designation is a verbal description of the data represented by the symbols:

(10) Closing day enrollment (Column I)
(11) Row of column totals (Row 9)
(12) All (6) program levels included (1-6)
(13) All LEA's included (1-n)

In each case, the data items are represented in this way by specifying within the parentheses the column first, row second and then those other dimensions which uniquely locate the data with respect to the data form. This specification is then further explicated in words following each set of symbols.

Finally, following the specification of the location of the data item is the statement of the content of the data to be found there in brackets. For example, for the sample data item given, the datum which is contained in that item is the number of students (14) .

Number of students, then, is the actual datum which is to be manipulated. It is the datum (14) which is entered in the location specified by the data item (5) .

For some management questions, the data item column shows "None available." In these cases, no data are available presently. These questions represent information requirements which the Pupil Services Unit is making plans to meet. Since these requirements were known when the PDAP was developed, they are included in the chart. The analysis statements for these questions will assist Pupil Services in developing data collection and analyses procedures.

Each analysis statement consists of a description in words (15) of the analysis as well as a mathematical formula (16) when the items are defined in the third column. In the analysis formulations, each data item (all symbols taken together and enclosed in parentheses)

containing data to be manipulated is preceded by its form number (17). The algebraic manipulations performed on the data are shown by the traditional algebraic and arithmetic symbols. No algebraic operations are ever performed within the parentheses defining the data item, since these define location of single units of data to be manipulated. Thus addition, subtraction, division, etc. never appear within the parentheses. Data items are manipulated according to arithmetic or algebraic laws, and operations. In our example, the summation across LEA's (18) and across program levels (19) appears before the form number and only the dimensions of row and column (20) stay within the parentheses. Note therefore that in this example the data item is represented only by (I,9). The symbolic 1-6 and 1-n do not appear within the parentheses since the dimensions they represent (program level and LEA's) are being summed across. The first analysis statement indicates that the total closing day enrollment CDE 148, Form I, (I,9) is summed across all LEA's $\sum_{\text{LEA's}}$ (18) and across all program levels $\sum_{\text{Program levels}}$ (19). This analysis then provides the closing enrollment of handicapped children in all Special Education programs in response to the first management question.

Further rules have been developed to handle other situations. Within the data item each dimension is set off by a comma, and it has already been shown that when each and all of a number of categories within a dimension are used a hyphen appears between the first and last category. In our example every one of all six program levels has been used and this appears in the data item as 1-6. When only certain categories of a dimension are used, each category is named and separated by an ampersand. Using our example it might appear thus, (I, 9, 1&2&4&6). In the verbal statement of the data item the categories are again each named and separated by ampersands. The ampersand has also been used between data items in the analysis to indicate that an operation is to be carried out separately for each of the data items connected in series by ampersands.

In some cases several rows intersect with a common column cell in a table on a form. In the data item such a case is formulated thus (2,1*2*3), with each of the rows named and separated by an asterisk, and the intersecting column designated. The designation '1 list' is sometimes used for a

dimension designated in the same sense as 1-n. It means that the rows of a particular table are a list of something, such as names of teachers. When a matrix is one of several items on a form its item number followed by a colon precedes its column and row designation within the parenthesis (5:I,8). Items for which no numbers were originally assigned in the forms are designated as "NIN" and assigned a number.

Finally, when separate items are used as dimensions these items each in a parenthesis are set off by commas following the rule for specifying dimensions. Then, the set of items specifying the dimensions is bracketed and preceded by the appropriate form number.

The above example gives the reader an idea of the major final product of the PDAP development study which forms the basis for the process guide contained herein.

END

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